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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/565,652	01/24/2006	Takeshi Iwasaki	284808US0PCT	6145
22850	7590	10/01/2007	EXAMINER	
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			TESKIN, FRED M	
			ART UNIT	PAPER NUMBER
			1713	
			NOTIFICATION DATE	DELIVERY MODE
			10/01/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/565,652

Applicant(s)

IWASAKI ET AL.

Examiner

Fred M. Teskin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 6 and 8 is/are rejected.
- 7) ☒ Claim(s) 4, 5, 7 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 January 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>20060124</u> . | 6) <input type="checkbox"/> Other: ____ |

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Claims 1-8 are currently pending and under examination herein.

The abstract is objected to because it is not limited to a single paragraph.

Correction is required. See MPEP 608.01(b).

Claims 4 and 5 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim. See MPEP § 608.01(n). As presented, claim 4 (and its dependent claim) is alternatively dependent on claim 3, another multiple dependent claim. Accordingly, claims 4-5 have not been further treated on the merits.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6555629 (Pysall et al).

Reference to Pysall et al discloses a process for the continuous production of free radical solution polymers, wherein at least two reaction "partners" (e.g., monomer/solvent and initiator/solvent mixtures) are conducted through a micromixer and combined and mixed with one another before being fed into a tube reactor (col. 1, ll. 5-10; col. 2, ll. 57-60 and col. 5, ll. 5-10). Their specifically described reactor is comprised of three separately heatable tubes (21, 22 and 23) (Fig. 1), having nominal diameters of 10 mm (21, 22) and 20 mm (23). As such, the reference differs from claims 1-3 only in that the stated tube diameters fall outside the claimed ranges of "2 mm or less" (claim 1) and "1 mm or less" (claim 3). Nevertheless, as apparent from use of the term "nominal", the stated diameters are merely exemplary and, moreover, the patentees teach that tube diameters "may be chosen freely and are determined by the desired throughput of solution polymers" (col. 5, ll. 19-22). Tube diameter is thus recognized in the reference as a result-effective parameter affecting throughput of solution polymers. Accordingly, those of ordinary skill in the art would have been led to optimize that variable in consideration of the desired degree of reactor throughput. Discovery of an optimum value for an art-recognized result effective variable in a known process is ordinarily within the skill of the art, *In re Boesch*, 205 USPQ 219 (CCPA 1980). In the present case, modifying the Pysall et al process by utilizing a reactor tube(s) having an inner diameter within the presently claimed ranges would have been *prima facie* obvious to one of ordinary skill in the art as a routine matter of optimization.

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Claim 6 is rejected under 35 U.S.C. 102(b) as being anticipated by Fouillet et al (US 2003/0082081).

Fouillet et al describe a microfluidic device for parallel and synchronized injecting of different reagents into mobile reaction chambers in micro-capillaries or micro-channels (0015). They state that the micro-capillaries/micro-channels can be of very small diameter, typically of several micron (μm) to several hundreds of μm (0041). A parallel arrangement of a plurality of micro-capillaries or micro-channels (21 to 26) is shown in Fig. 2A. This figure also depicts plural heating zones located along and surrounding the microcapillaries, i.e., thermal zones 31 and 32, which can be formed by using a thermo-transferring fluid circulating in proximity to the microcapillaries (0046). A biological reactor incorporating microcapillaries 21 to 26 also is described (Fig. 6-7 and 0068-0079).

Thus, the reference device includes heating zone elements and a thermo-transferring fluid, which correspond to the "jacket" and "temperature-regulating fluid" of the claimed apparatus, as well as a plurality of micro-capillaries of micron-size diameter located within the heating zones. The latter elements correspond to the "plurality of round tubes ... arranged in parallel in the jacket" of the claimed apparatus, and meet the limitation as to inner diameter of each tube (2 mm or less). As such, claim 6 is considered readable on the prior art device of Fouillet et al.

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Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fouillet et al.

Fouillet et al, discussed above, differs from claim 7 in stating that micro-capillaries 21-26 can be fixed to elongated part 10 (corresponding to applicants' main body) by gluing (0041). However, it is submitted that those of ordinary skill in the art would have perceived practical benefits in making the micro-capillaries detachable from the elongated part, at least in terms of facilitating access to and/or replacement of individual tubes. Motivated by such practical considerations, it would have been obvious to one of ordinary skill in the art at the time of invention to detachably attach the micro-capillaries of the Fouillet et al device to elongated part 10, in compliance with claim 8.

Claim 7 is objected to as being dependent on a rejected base claim but would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claim.

The following is a statement of reasons for the indication of allowable subject matter: A microreactor having the structural features recited in claim 7 is not disclosed nor adequately suggested in the prior art of record.


Any inquiry concerning this communication should be directed to Examiner F. M. Teskin whose telephone number is (571) 272-1116. The examiner can normally be

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reached on Monday through Thursday from 7:00 AM - 4:30 PM, and can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The appropriate fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


FRED TESKIN
PRIMARY EXAMINER
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FMTeskin/09-18-07